

Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1-88. (Cancelled)

89. (New)

A communication system comprising a first information processor, a second information processor, a first communication control unit for controlling the communication of the first information processor, a second communication control unit for controlling the communication of the second information processor, and a server for establishing communication between the first information processor and the second information processor,

wherein the first information processor includes:

a reference port receiver for receiving reference port information showing the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted for leaving transmission record in the first communication control unit;

a bubble packet transmitter for transmitting the bubble packet to the second communication control unit via the first communication control unit in accordance with the reference port information;

a detection packet transmitter for transmitting a port detection packet to the server in order to detect the position of bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet; and

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port, and

the second information processor includes:

a reference port detection packet transmitter for transmitting a reference port detection packet for detecting the position of the reference port;

a bubble packet transmitting port information receiver for receiving bubble packet transmitting port information showing the position of the bubble packet transmitting port; and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port showing the bubble packet transmitting port information, and

the server includes:

a reference port detector which receives the reference port detection packet transmitted from the second information processor for detecting the position of the reference port in accordance with the reference port detection packet;

a reference port transmitter for transmitting reference port information showing the position of the reference port detected by the reference port detector to the first information processor;

a bubble packet transmitting port detector which receives the port detection packet transmitted from the first information processor for detecting the position of the bubble packet transmitting port in accordance with the port detection packet; and

a bubble packet transmitting port transmitter for transmitting the bubble packet transmitting port information to the second information processor.

90. (New) The communication system of claim 89,

wherein the detection packet transmitter transmits the port detection packet in the first information processor before and/or after the bubble packet transmitter transmits the bubble packet.

91. (New) The communication system of claim 89 or 90,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the first communication control unit in the server.

92. (New) The communication system of claim 89,

wherein the first information processor further includes:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit via the first communication control unit, and

the server further includes:

a port number differential detector which receives the port number differential detection packet for detecting the port number differential of the first communication control unit in accordance with the port number differential detection packet, and

the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential detected by the port number differential detector.

93. (New) The communication system of claim 90,

wherein the first information processor further includes:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit via the first communication control unit, and

the server further includes:

a port number differential detector which receives the port number differential detection packet for detecting the port number differential of the first communication control unit in accordance with the port number differential detection packet, and

the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential detected by the port number differential detector.

94. (New) A communication system comprising a first information processor, a second information processor, a first communication control unit for controlling the communication of the first information processor, a second communication control unit for controlling the communication of the second information processor, and a server for establishing communication between the first information processor and the second information processor,

wherein the first information processor includes:

a reference port receiver for receiving reference port information showing the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted for leaving transmission record in the first communication control unit;

a bubble packet transmitter for transmitting the bubble packet to the second communication control unit via the first communication control unit in accordance with the reference port information;

a detection packet transmitter for transmitting a port detection packet to the server in order to detect the position of bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet;

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port;

a detecting port information receiver for receiving detecting port information showing the port position of the first communication control unit through which the port detection packet has passed;

a bubble packet transmitting port detector for detecting the position of the bubble packet transmitting port in accordance with detecting port information received by the detecting port information receiver; and

a bubble packet transmitting port transmitter for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector to the second information processor via the server, and

the second information processor includes:

a reference port detection packet transmitter for transmitting a reference port detection packet for detecting the position of the reference port;

a bubble packet transmitting port information receiver for receiving bubble packet transmitting port information showing the position of the bubble packet transmitting port; and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port showing the bubble packet transmitting port information, and

the server includes:

a reference port detector which receives the reference port detection packet transmitted from the second information processor for detecting the position of the reference port in accordance with the reference port detection packet;

a reference port transmitter for transmitting reference port information showing the position of the reference port detected by the reference port detector to the first information processor;

a detecting port detector which receives the port detection packet transmitted from the first information processor for detecting the port position of the first communication control unit through which the port detection packet has passed in accordance with the port detection packet; and

a detecting port information transmitter for transmitting detecting port information showing the port position detected by the detecting port detector to the first information processor.

95. (New) The communication system of claim 94,

wherein the detection packet transmitter transmits the port detection packet in the first information processor before and/or after the bubble packet transmitter transmits the bubble packet.

96. (New) The communication system of claim 94,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the communication control unit in the first information processor.

97. (New) The communication system of claim 95,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the communication control unit in the first information processor.

98. (New) The communication system of claim 94,

wherein the first information processor further includes:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit via the first communication control unit;

a port differential information receiver for receiving port differential information showing the port position of the first communication control unit through which the port number differential detection packet has passed; and

a port number differential detector for detecting the port number differential in the first communication control unit in accordance with port differential information received by the port differential information receiver, and

the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the first communication control unit detected by the port number differential detector, and

the server further includes:

a port differential information detector which receives the port number differential detection packet for detecting the port position of the first communication control unit through which the port number differential detection packet has passed; and

a port number information transmitter for transmitting port differential information showing the port position detected by the port differential information detector to the first information processor.

99. (New) The communication system of claim 95,

wherein the first information processor further includes:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit via the first communication control unit;

a port differential information receiver for receiving port differential information showing the port position of the first communication control unit through which the port number differential detection packet has passed; and

a port number differential detector for detecting the port number differential in the first communication control unit in accordance with port differential information received by the port differential information receiver, and

the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the first communication control unit detected by the port number differential detector, and

the server further includes:

a port differential information detector which receives the port number differential detection packet for detecting the port position of the first communication control unit through which the port number differential detection packet has passed; and

a port number information transmitter for transmitting port differential information showing the port position detected by the port differential information detector to the first information processor.

100. (New) A first information processor communicating with a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, comprising:

a reference port information receiver for receiving reference port information showing the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted for leaving transmission record in the first communication control unit;

a bubble packet transmitter for transmitting the bubble packet to the second communication control unit via the first communication control unit in accordance with the reference port information;

a detection packet transmitter for transmitting a port detection packet in order to detect the position of bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet; and

a reply packet receiver for receiving the reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port.

101. (New) The first information processor of claim 100,

wherein the detection packet transmitter transmits the port detection packet before and/or after the bubble packet transmitter transmits the bubble packet.

102. (New) The first information processor of claim 100,

wherein a port for bubble packet transmission that is a port for transmitting the bubble packet in the second communication control unit is a port assigned after assigning a predetermined port from the reference port.

103. (New) The first information processor of claim 101,

wherein a port for bubble packet transmission that is a port for transmitting the bubble packet in the second communication control unit is a port assigned after assigning a predetermined port from the reference port.

104. (New) The first information processor of claim 100, further comprising:

a detecting port information receiver for receiving detecting port information showing the port position of the first communication control unit through which the port detection packet has passed;

a bubble packet transmitting port detector for detecting the position of the bubble packet transmitting port in accordance with detecting port information received by the detecting port information receiver; and

a bubble packet transmitting port information transmitter for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector.

105. (New) The first information processor of claim 101, further comprising:

a detecting port information receiver for receiving detecting port information showing the port position of the first communication control unit through which the port detection packet has passed;

a bubble packet transmitting port detector for detecting the position of the bubble packet transmitting port in accordance with detecting port information received by the detecting port information receiver; and

a bubble packet transmitting port information transmitter for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector.

106. (New) The first information processor of claim 104,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the communication control unit.

107. (New) The first information processor of claim 105,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the communication control unit.

108. (New) The first information processor of claim 104, further comprising:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit via the first communication control unit;

a port differential information receiver for receiving port differential information showing the port position of the first communication control unit through which the port number differential detection packet has passed; and

a port number differential detector for detecting the port number differential in the first communication control unit in accordance with port differential information received by the port differential information receiver,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential in the first communication control unit detected by the port number differential detector.

109. (New) The first information processor of claim 105, further comprising:

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting the port number differential in the first communication control unit via the first communication control unit;

a port differential information receiver for receiving port differential information showing the port position of the first communication control unit through which the port number differential detection packet has passed; and

a port number differential detector for detecting the port number differential in the first communication control unit in accordance with port differential information received by the port differential information receiver,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential in the first communication control unit detected by the port number differential detector.

110. (New) A first information processor communicating with a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor,

wherein a bubble packet for leaving transmission record in the second communication control unit is transmitted, from the second information processor via the second communication control unit, to the first communication control unit comprising:

a reference port detection packet transmitter for transmitting a reference port detection packet for detecting the position of a reference port, a port in the first communication control unit, that is a reference for transmission of the bubble packet;

a bubble packet transmitting port information receiver for receiving bubble packet transmitting port information showing the position of bubble packet transmitting port, a port of the second communication control unit, which is used in transmission of the bubble packet; and

a reply packet transmitter for transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information.

111. (New) The first information processor of claim 110,

wherein the reply packet transmitter transmits the reply packet by using N different ports (N is an integer of 2 or over) of the first communication control unit.

112. (New) The first information processor of claim 111,

wherein the N is more than the number of ports that can be assigned in a range from the reference port to the port with the bubble packet transmitted thereto in the first communication control unit.

113. (New) A server for establishing communication between a first information processor and a second information processor via a first communication control unit for

controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, comprising:

a reference port detector which receives a reference port detection packet transmitted from the second information processor via the second communication control unit for detecting the position of the reference port in accordance with the reference port detection packet in order to detect the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted by the first information processor for leaving transmission record in the first communication control unit;

a reference port transmitter for transmitting reference port information showing the position of the reference port detected by the reference port detector to the first information processor;

a bubble packet transmitting port detector which receives a port detection packet transmitted from the first information processor for detecting the position of the bubble packet transmitting port in accordance with the port detection packet in order to detect the position of the bubble packet transmitting port, a port in the first communication control unit, which is used in transmission of the bubble packet from the first information processor to the second communication control unit; and

a bubble packet transmitting port information transmitter for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected by the bubble packet transmitting port detector to the second information processor.

114. (New) The server of claim 113,

wherein the bubble packet transmitting port detector detects the position of the bubble packet transmitting port by using the port number differential of the first communication control unit.

115. (New) The server of claim 113, further comprising:

a port number differential detector which receives a port number differential detection packet transmitted from the first information processor for detecting the port number differential of the communication control unit in accordance with the port number differential detection packet in order to detect the port number differential of the first communication control unit,

wherein the bubble packet transmitting port detects the position of the bubble packet transmitting port by using the port number differential detected by the port number differential detector.

116. (New) The server of claim 114, further comprising:

a port number differential detector which receives a port number differential detection packet transmitted from the first information processor for detecting the port number differential of the communication control unit in accordance with the port number differential detection packet in order to detect the port number differential of the first communication control unit,

wherein the bubble packet transmitting port detects the position of the bubble packet transmitting port by using the port number differential detected by the port number differential detector.

117. (New) A server for establishing communication between a first information processor and a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, comprising:

a reference port detector which receives a reference port detection packet transmitted from the second information processor via the second communication control unit for detecting the position of the reference port in accordance with the reference port detection packet in order to detect the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted by the first information processor for leaving transmission record in the first communication control unit;

a reference port transmitter for transmitting reference port information showing the position of the reference port detected by the reference port detector to the first information processor; and

a detecting port detector which receives a port detection packet transmitted from the first information processor for detecting the position of the first communication control unit through which the port detection packet has passed in order to detect the position of the bubble packet transmitting port, a port in the first communication control unit, which is used in transmission of the bubble packet from the first information processor to the second communication control unit.

118. A communication method for establishing communication between a first information processor and a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, comprising:

a reference port receiving step for receiving reference port information showing the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted for leaving transmission record in the first communication control unit;

a bubble packet transmitting step for transmitting the bubble packet to the second communication control unit via the first communication control unit in accordance with the reference port information;

a detection packet transmitting step for transmitting a port detection packet in order to detect the position of the bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet; and

a reply packet receiving step for receiving the reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port.

119. (New) The communication method of claim 118,

wherein the port detection packet is transmitted in the detection packet transmitting step before and/or after the bubble packet is transmitted in the bubble packet transmitting step.

120. (New) The communication method of claim 118,

wherein the bubble packet is transmitted to a port assigned after assignment of a predetermined port from the reference port in the bubble packet transmitting step.

121. (New) The communication method of claim 119,

wherein the bubble packet is transmitted to a port assigned after assignment of a predetermined port from the reference port in the bubble packet transmitting step.

122. (New) The communication method of claim 118, further comprising:

a detecting port information receiving step for receiving detecting port information showing the port position of the first communication control unit through which the port detection packet has passed;

a bubble packet transmitting port detecting step for detecting the position of the bubble packet transmitting port in accordance with detecting port information received in the detecting port information receiving step; and

a bubble packet transmitting port transmitting step for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected in the bubble packet transmitting port detecting step.

123. (New) The communication method of claim 119, further comprising:

a detecting port information receiving step for receiving detecting port information showing the port position of the first communication control unit through which the port detection packet has passed;

a bubble packet transmitting port detecting step for detecting the position of the bubble packet transmitting port in accordance with detecting port information received in the detecting port information receiving step; and

a bubble packet transmitting port transmitting step for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected in the bubble packet transmitting port detecting step.

124. (New) A communication method for establishing communication between a first information processor and a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor,

wherein a bubble packet for leaving transmission record in the second communication control unit is transmitted to the first communication control unit from the second information processor via the second communication control unit, comprising:

a reference port detection packet transmitting step for transmitting a reference port detection packet for detecting the position of the reference port, a port in the first communication control unit, that is a reference for transmission of the bubble packet;

a bubble packet transmitting port receiving step for receiving bubble packet transmitting port information showing the position of the bubble packet transmitting port, a port of the second communication control unit, which is used in transmission of the bubble packet from the second information processor; and

a reply packet transmitting step for transmitting a reply packet to the bubble packet transmitting port indicated by the bubble packet transmitting port information.

125. (New) The communication method of claim 124,

wherein the reply packet is transmitted by using N different ports (N is an integer of 2 or over) of the first communication control unit in the reply packet transmitting step.

126. (New) A communication method used for the server in a communication system including a first information processor, a first communication control unit for controlling the communication of the first information processor, a second information processor, a second communication control unit for controlling the communication of the second information processor, and a server, comprising:

a step of receiving a reference port detection packet transmitted from the second information processor via the second communication control unit and detecting the position of the reference port in accordance with the reference port detection packet in order to detect the position of the reference port, a port in the second communication control unit, that is a reference for transmission of a bubble packet transmitted by the first information processor for leaving transmission record in the first communication control unit;

a step of transmitting reference port information showing the position of the reference port detected in the reference port detecting step to the first information processor; and

a step of receiving a port detection packet transmitted from the first information processor in order to detect the position of the bubble packet transmitting port, a port in the first communication control unit, which is used in transmission of the bubble packet from the first information processor to the second communication control unit.

127. (New) The communication method of claim 126, further comprising:

a step of detecting the position of the bubble packet transmitting port in accordance with the port detection packet; and

a bubble packet transmitting port information transmitting step for transmitting bubble packet transmitting port information showing the position of the bubble packet transmitting port detected.

128. (New) The communication method of claim 126, further comprising:

a detecting port detecting step for detecting the port position of the communication control unit through which the port detection packet has passed in accordance with the port detection packet; and

a detecting port information transmitting step for transmitting detecting port information showing the port position detected in the detecting port detecting step.